

WHAT IS CLAIMED IS:

1. A method for producing a selected polypeptide comprising in an avian host:

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- (a) ablating lymphoid cells in a first avian host embryo;
 - (b) infusing into said embryo bursal stem cells from a donor, wherein said bursal stem cells have been infected with a transducing virus that contains a nucleic acid encoding said selected polypeptide,

10 whereby lymphoid cells of said first avian host produce said selected polypeptide.

2. The method of claim 1, wherein ablation is achieved by treatment of said first avian host embryo with radiation or an alkylating agent.

15 3. The method of claim 1, wherein said avian host is a chicken.

4. The method of claim 1, wherein the transducing virus is a retrovirus.

20 5. The method of claim 1, further comprising

- (c) obtaining bursal follicle cells from said first avian host after hatching; and
- (d) repopulating a second avian host embryo, lymphoid cells of which have been ablated.

25 6. The method of claim 5, wherein the transducing virus further encodes an anti-apoptotic factor

7. The method of claim 6, wherein the anti-apoptotic factor is NR-13.

8. The method of claim 1, wherein the selected polypeptide is an immunomodulator, a hormone, an enzyme, an antibody, a cell signaling molecule, a DNA binding protein or a protein inhibitors.
- 5 9. The method of claim 1, wherein said nucleic acid encoding said selected polypeptide is fused to a nucleic acid encoding an immunoglobulin light chain.
- 10 10. The method of claim 9, wherein the fusion between the selected polypeptide and immunoglobulin light chain encoding nucleic acids is through a nucleic acid encoding cleavable peptide.
11. The method of claim 10, wherein said cleavable peptide sequence is an IgA hinge region.
- 15 12. The method of claim 10, further comprising the step of cleaving said cleavable peptide sequence.
13. The method of claim 9, further comprising the step of isolating said selected polypeptide.
- 20 14. The method of claim 13, wherein said selected polypeptide is isolated from an egg yolk.
- 25 15. The method of claim 13, wherein said selected polypeptide is purified using ammonium sulfate precipitation.
16. The method of claim 14, wherein said selected polypeptide is purified 100-fold over the starting material.
- 30 17. The method of claim 14, wherein said selected polypeptide is purified to be substantially free of other polypeptides.

18. The method of claim 14, wherein said selected polypeptide is purified to 95% purity.
- 5 19. The method of claim 14, wherein said selected polypeptide is purified to homogeneity.
20. The method of claim 1, wherein said first avian host embryo is 15 days old.
- 10 21. The method of claim 1, wherein said embryonic bursal cells are from a 15 day old embryo.
22. The method of claim 1, wherein said first avian host embryo and said embryonic bursal cells are syngenic.
- 15 23. A method of repopulating an avian host with transduced bursal cells comprising:
 - (a) providing an avian bursal stem cell, wherein said bursal stem cell is syngenic to said avian host;
 - 20 (b) transducing said bursal stem cell with a first transducing virus that contains a nucleic acid encoding an apoptosis inhibitor; and
 - (c) infusing said avian host with the transduced bursal stem cell.
- 25 24. The method of claim 23, further comprising transducing said bursal stem cell at a multiplicity of infection of great than 1.
25. The method of claim 23, wherein said avian host is a chicken.
- 30 26. The method of claim 23, wherein said bursal stem cell also is transduced with a second transducing virus containing a nucleic acid encoding a selected polypeptide.

27. The method of claim 23, wherein said selected polypeptide is an immunomodulator, a hormone, an enzyme, an antibody, a cell surface molecule, a DNA binding protein or a protein inhibitors.

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28. The method of claim 23, wherein the first transducing virus is a retrovirus.

29. The method of claim 23, wherein said avian host is an embryo, lymphoid cells of which have been ablated.

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30. The method of claim 29, further comprising

- (d) obtaining bursal follicle cells from said avian host after hatching; and
- (e) repopulating a second avian host embryo, lymphoid cells of which have been ablated.

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